

Serial No. 10/080,114  
Amendment Dated 06/02/2005  
Reply to Office Action of 01/28/2005

**Amendments to the Claims:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

1. (Currently Amended) An isolated polynucleotide which encodes a polypeptide with sucrose synthase activity comprising a member selected from the group consisting of:
  - (a) a polynucleotide having at least 95% sequence identity, as determined by the GAP algorithm under default parameters, to the polynucleotide of SEQ ID NO: 1 or SEQ ID NO: 11;
  - (b) a polynucleotide encoding ~~a the polypeptide of SEQ ID NO: 2 or SEQ ID NO: 12;~~ having at least 80% sequence identity to, and having at least one epitope in common with, a polypeptide of SEQ ID NO: 2 or SEQ ID NO: 12, wherein said sequence identity is determined by the GAP algorithm under default parameters; and,
  - (c) a polynucleotide of SEQ ID NO: 1 or SEQ ID NO: 11; ~~and~~
  - (d) ~~a polynucleotide which is complementary to a polynucleotide of (a), (b), or (c).~~
2. (Currently Amended) A recombinant expression cassette, comprising the polynucleotide of claim 1 operably linked, ~~in sense or anti-sense orientation,~~ to a promoter.
3. (Original) A host cell comprising the recombinant expression cassette of claim 2.

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4. (Previously Amended) A transgenic plant comprising the recombinant expression cassette of claim 2.
5. (Original) The transgenic plant of claim 4, wherein said plant is a monocot.
6. (Original) The transgenic plant of claim 4, wherein said plant is a dicot.
7. (Original) The transgenic plant of claim 4, wherein said plant is selected from the group consisting of: maize, soybean, sunflower, sorghum, canola, wheat, alfalfa, cotton, rice, barley, millet, peanut, and cocoa.
8. (Currently Amended) A transgenic seed from the transgenic plant of claim 4.
9. (Previously Amended) A method of modulating the level of sucrose synthase in a transgenic plant, comprising:
  - (a) introducing into a plant cell a recombinant expression cassette comprising the polynucleotide of claim 1 operably linked to a promoter;
  - (b) culturing the plant cell under plant cell growing conditions;
  - (c) regenerating said transgenic plant; and growing said transgenic plant to express said polynucleotide, to modulate the level of sucrose synthase in said plant.
10. (Original) The method of claim 9, wherein said plant is selected from the group consisting of: maize, soybean, sunflower, sorghum, canola, wheat, alfalfa, cotton, rice, barley, millet, peanut, and cocoa.
11. (Currently Amended) The method of claim 9, wherein the encoded protein comprises a member selected from the group consisting of:

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- (a) a polypeptide of SEQ ID NO: 2 or SEQ ID NO: 12;
  - (b) a polypeptide having at least 95% identity to, and having at least one epitope in common with, the polypeptide of SEQ ID NO: 2 or SEQ ID NO: 12, wherein said sequence identity is determined by using the GAP algorithm under default parameters; and
  - (c) at least one polypeptide encoded by the polynucleotide of claim 1.
12. (Cancelled)
13. (Currently Amended) A method of increasing cellulose production in the stalk tissue of a transgenic plant, comprising:
- (a) introducing into a plant cell a recombinant expression cassette comprising a sucrose synthase polynucleotide selected from the group consisting of: a polynucleotide of claim 1, Sus1 from maize, or Sh1 from maize, operably linked to a promoter;
  - (b) culturing the plant cell under plant cell growing conditions;
  - (c) regenerating said transgenic plant; and
  - (d) growing said transgenic plant to express said polynucleotide to increase the level of sucrose synthase in said transgenic plant so as to increase the cellulose production in the stalk tissue of the transgenic plant.
14. (Original) The method of claim 13, wherein said plant is selected from the group consisting of: maize, soybean, sunflower, sorghum, canola, wheat, alfalfa, cotton, rice, barley, millet, peanut, and cocoa.
15. (Cancelled)

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16. (Original) The method of claim 13, wherein said promoter preferentially directs expression in stalk tissue.
17. (Currently Amended) A method of increasing the concentration of cellulose in the tissues of a seed of a transgenic plant, comprising:
  - (a) introducing into a plant cell a recombinant expression cassette comprising a sucrose synthase polynucleotide selected from the group consisting of: a polynucleotide of claim 1, Sus1 from maize, or Sh1 from maize;
  - (b) culturing the plant cell under plant cell growing conditions;
  - (c) regenerating said transgenic plant; and
  - (d) growing said transgenic plant to express said polynucleotide to increase the level of sucrose synthase in said seed of said transgenic plant so as to increase the concentration of cellulose in the tissues of a seed of said transgenic plant.
18. (Original) The method of claim 17, wherein said plant is selected from the group consisting of: maize, soybean, sunflower, sorghum, canola, wheat, alfalfa, cotton, rice, barley, millet, peanut, and cocoa.
19. (Cancelled)
20. (Original) The method of claim 17, wherein said promoter preferentially directs expression in the seed.
21. (Original) The method of claim 17, wherein said promoter preferentially directs expression in the pericarp.